



IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Original): A process chamber cleaning method in a substrate processing apparatus configured to perform a predetermined process on a target substrate accommodated in a process chamber, the method comprising:

at least one cycle of alternately performing an operation of generating plasma of a gas containing oxygen within the process chamber, and an operation of generating plasma of a gas containing nitrogen within the process chamber.

Claim 2 (Original): The process chamber cleaning method according to claim 1, wherein the plasma has an electron temperature of 2 eV or less.

Claim 3 (Original): The process chamber cleaning method according to claim 1, wherein the plasma is generated by microwaves supplied into the process chamber through a planar antenna having a plurality of slots.

Claim 4 (Original): The process chamber cleaning method according to claim 1, wherein the gas containing oxygen is oxygen gas and the gas containing nitrogen is nitrogen gas.

Claim 5 (Original): The process chamber cleaning method according to claim 1, wherein the predetermined process performed in the substrate processing apparatus is a nitriding process or oxidizing process.

Claim 6 (Original): A computer readable storage medium containing software used for a substrate processing apparatus configured to perform a predetermined process on a target substrate accommodated in a process chamber, wherein the software, when executed by a computer, controls the apparatus to clean the process chamber by at least one cycle of alternately performing an operation of generating plasma of a gas containing oxygen within the process chamber, and an operation of generating plasma of a gas containing nitrogen within the process chamber.

Claim 7 (Original): A substrate processing apparatus comprising:
a process chamber configured to accommodate a target substrate;
a processing mechanism configured to perform a predetermined process on the target substrate within the process chamber;
a plasma generation mechanism configured to generate plasma within the process chamber to clean an interior of the process chamber; and
a control mechanism configured to control the plasma generation mechanism,
wherein the control mechanism controls the plasma generation mechanism to clean the process chamber by at least one cycle of alternately performing an operation of generating plasma of a gas containing oxygen within the process chamber, and an operation of generating plasma of a gas containing nitrogen within the process chamber.

Claim 8 (Original): The substrate processing apparatus according to claim 7, wherein the plasma has an electron temperature of 2 eV or less.

Claim 9 (Original): The substrate processing apparatus according to claim 7, wherein the plasma generation mechanism comprises a planar antenna having a plurality of slots, a

microwave generation source, and a waveguide configured to guide microwaves from the microwave generation source to the planar antenna, so that microwaves are supplied through the waveguide and the planar antenna into the process chamber.

Claim 10 (Original): The substrate processing apparatus according to claim 7, wherein the gas containing oxygen is oxygen gas and the gas containing nitrogen is nitrogen gas.

Claim 11 (Original): The substrate processing apparatus according to claim 7, wherein the processing mechanism is configured to perform a nitriding process or oxidizing process on the target substrate.

Claim 12 (Original): A substrate processing method comprising:
cleaning a process chamber by at least one cycle of alternately performing an operation of generating plasma of a gas containing oxygen within the process chamber, and an operation of generating plasma of a gas containing nitrogen within the process chamber;
then, seasoning the process chamber by at least one operation of generating plasma of a gas containing oxygen or generating plasma of a gas containing nitrogen within the process chamber; and
then, installing a target substrate into the process chamber and performing a predetermined process on the target substrate.

Claim 13 (Original): The substrate processing method according to claim 12, wherein the predetermined process performed on the target substrate is a nitriding process or oxidizing process.

Claim 14 (Original): The substrate processing method according to claim 13, wherein the seasoning is arranged to generate plasma of a gas containing nitrogen where the predetermined process performed on the target substrate is a nitriding process, and the seasoning is arranged to generate plasma of a gas containing oxygen where the predetermined process performed on the target substrate is an oxidizing process.

Claim 15 (Original): The substrate processing method according to claim 12, wherein the plasma is set to have an electron temperature of 2 eV or less.

Claim 16 (Original): The substrate processing method according to claim 12, wherein, in cleaning the process chamber, low electron temperature plasma is generated by microwaves supplied into the process chamber through a planar antenna having a plurality of slots.

Claim 17 (Original): The substrate processing method according to claim 12, wherein, in cleaning the process chamber, the gas containing oxygen is oxygen gas and the gas containing nitrogen is nitrogen gas.

Claim 18 (New): The process chamber cleaning method according to claim 1, wherein a last cycle for performing process chamber cleaning includes a final operation period using plasma of the oxygen containing gas or using plasma the nitrogen containing gas, and the final operation period is longer than the former operations.

Claim 19 (New): The process chamber cleaning method according to claim 1, wherein vacuum-exhaust of the process chamber is performed between the operation of the generating plasma of the oxygen containing gas and the operation of the generating plasma of the nitrogen containing gas.

Claim 20 (New): The process chamber cleaning method according to claim 1, wherein vacuum-exhaust of the process chamber and introducing an inactive gas into the process chamber are performed between the operation of the generating plasma of the oxygen containing gas and the operation of the generating plasma of the nitrogen containing gas.